

Montana Energy Summit

Biomass Energy Systems

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Topics to Cover

- Woody biomass potential
- Air quality considerations
- Small scale vs. large scale?
- Heat or power or both?
- Fuel supply issues
- Financing options



Public Policy is Creating More Biomass

- Thin the Forests!
 - NFP,
 - HFI,
 - HFRA,
 - DOE, USDA, USDI
 - Energy bill



- What do we do with the biomass?
 - » Burn It **
 - » Chip It
 - » Leave It
 - » Use It

Disposal Problem

We have a lot of
Forest biomass



- USDA-DOE Billion Ton Report
 - 368 dry tons of forest biomass
 - 998 dry tons of ag biomass
 - Equivalent of 30% of USA oil use

How to convert it?

- Electricity vs Heat or Both
- Heat is the most valuable
- Multiple studies of straight electricity show \$.08-.14/kwh
 - Most significant issue is scale of power plant ;
 - Distance to haul wood critical

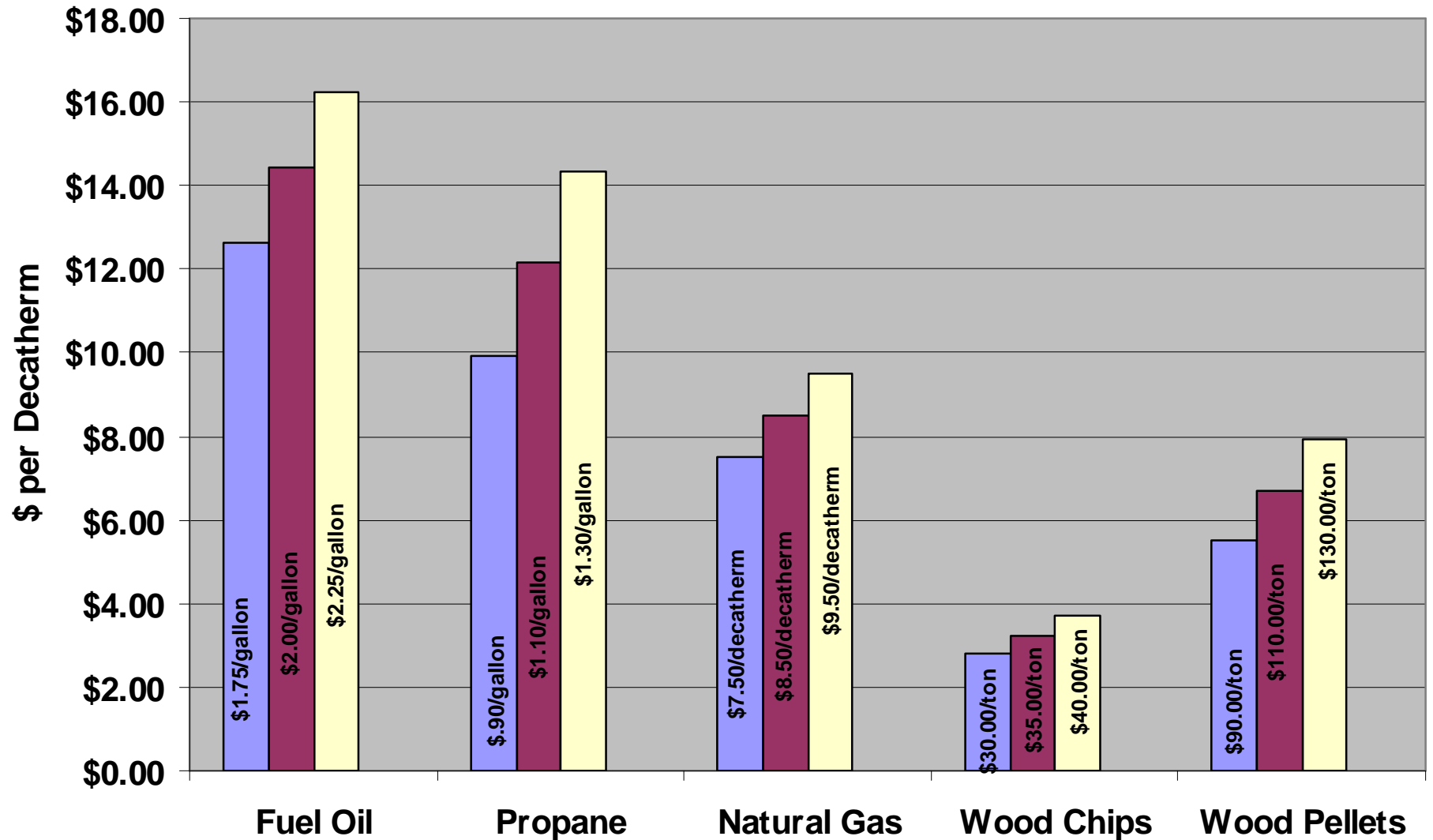


Heating Systems Fuels for Schools and Beyond

- Substantial savings;
- Small scale compared to power;
- Short haul distance;
- Green chips or pellets;
- Implementable Now



BTU Cost Comparison



Non Dollar Benefits

- Reduce smoke from disposal burning
 - Human/Enviro Health – SOX, NOX
 - Airshed Aesthetics – “Smokey Air”
 - Increase ability to burn for ecosystem benefits on our rare “burn days”
- Distributed systems;
- Local production and distribution
 - » Small business opportunities
 - » Create jobs
- Renewable – no net GHG

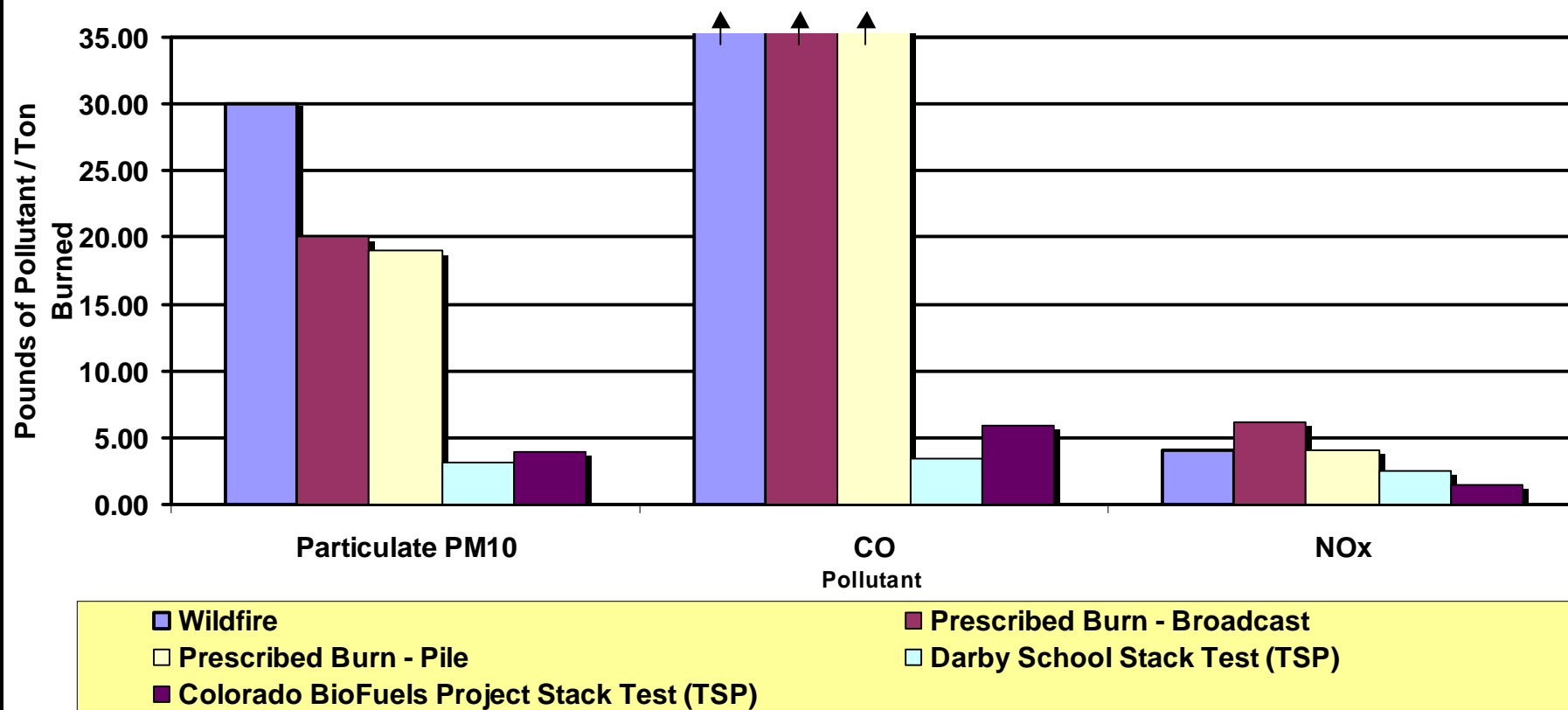
Air Quality

- Permitting is specific to each state
 - Boiler size can matter;
 - Cost of permits
 - Non-attainment area?
- This is NOT your old wood stove
 - High tech
 - High temperature



Air Quality

**Fuel Management (Prescription Techniques) -
Pollutant Emissions Comparisons**



Existing Systems

Chadron State College – 14 yr



University of Idaho -20+ yr



Wood Products
Industry



Darby, MT

Heating With Wood:

Three Options:

- Fully automated – large facilities
- Surge Bin – small facilities
- Pellet systems

Combined Heat and Power



Large Facility

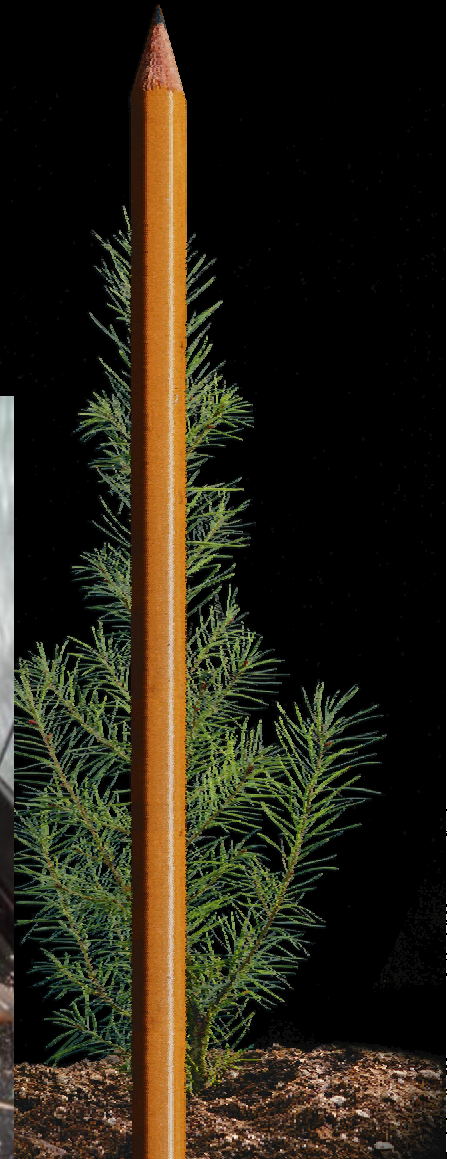


Darby, MT



Surge-bin System

Smaller,
Simpler,
Cheaper



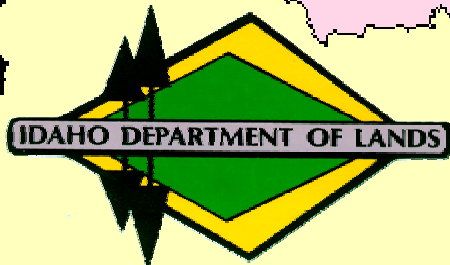
Pellet Systems

- Fuel is twice as costly
- Storage smaller, cheaper
- Boiler smaller, cheaper



170 k btu system



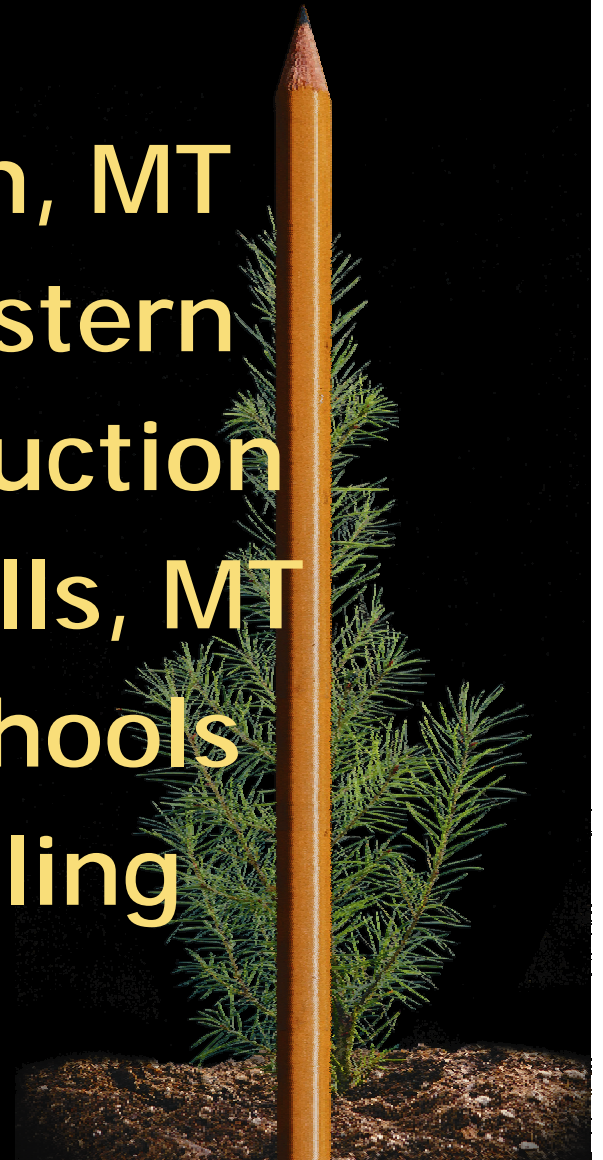


- 6 systems built.
- 6 more funded.
- 110+ facilities w/ completed Engineering Assessments.
- Commercialization Studies.
- 20-35 facilities to be assessed in 2005.



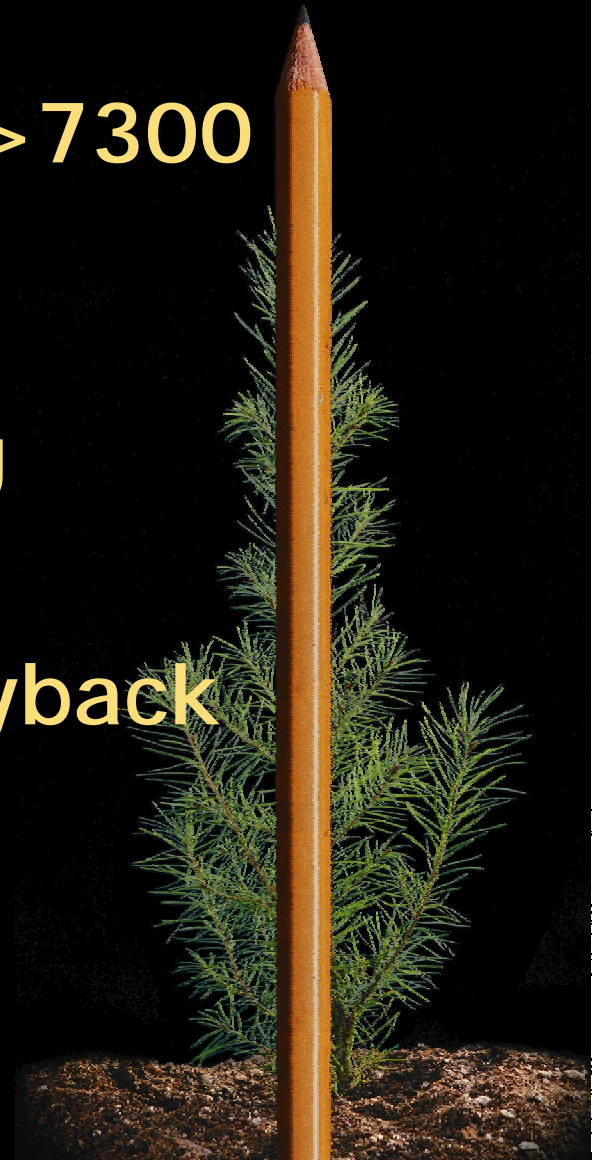
Design-Construction Projects

- First hospital – Lewistown, MT
- College Campus – UM Western
- Glacier H.S. – New construction
- Surge-bin – Thompson Falls, MT
- Two commercial Pellet schools
- Council, ID – heating/cooling



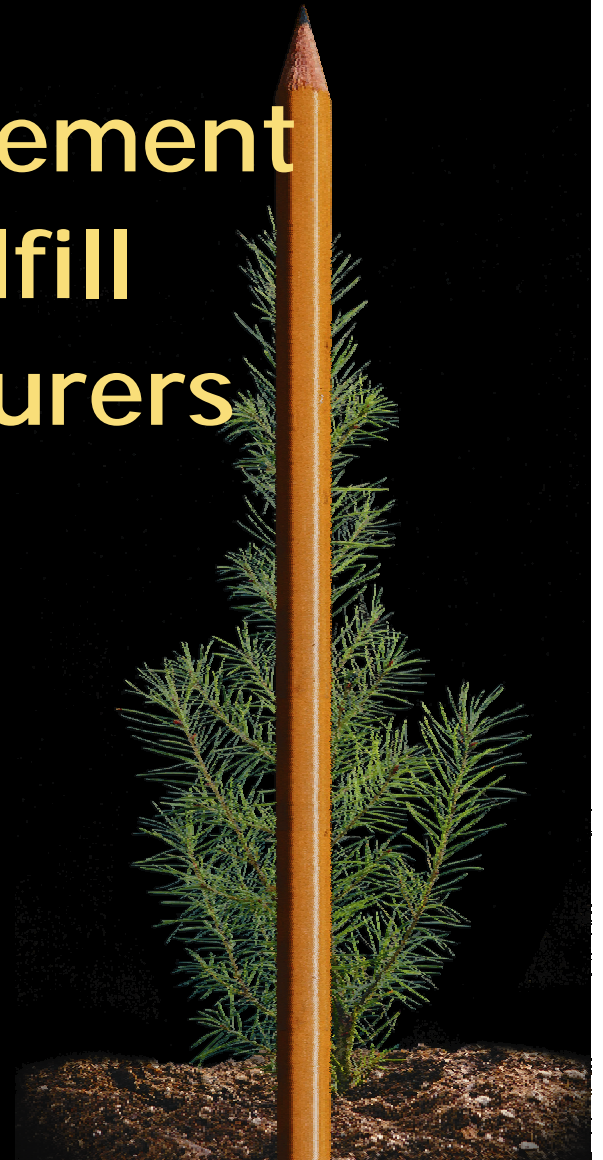
Commercialization

- MT Assessment
 - State boiler data base - >7300
 - Age, size, fuel type
 - Distance to forests
 - 3100 in the .5-5 mill BTU
- Economic analysis
 - 2,567 boilers < 15 yr payback
 - 367 > 30 yr old
- Available at
www.fuelsforschools.org



Sources of Fuel

- Slash from forest management
- Diversion from local landfill
- Residues from manufacturers
 - Post and Pole
 - Sawmills
 - House logs
 - Secondary manufacturers
- Power line clearing



Processing, Transporting and Storage

- What infrastructure do you already have?
 - Canned Wood – Roll-offs
 - Chip vans
 - Chippers – Grinder – size matters
 - Do you need storage mid-winter?
- Clustering projects



"Canned Wood"

Report available at:
www.fuelsforschools.org



Roll-Off at Landing

www.fuelsforschools.org - for
report or www.mtcdc.org



Whole tree processing at landing
Minimizes handling costs
Less Move-in cost for grinder



Financing Options

- Grants
 - Federal – USFS, Energy Bill provision
 - State
 - Foundations
- Loans
 - USDA Rural Development – REDLG, Rural Renewable Energy Program
 - CREB – Energy Bill
 - Municipal leases
- ESCO – Energy Service Corporations
 - Pay for changes through savings



Where can I get more Info

- www.fuelsforschools.org links to:
 - Manufacturers - consultants;
 - BERC's publication:
Wood-Chip Heating Systems
 - Monitoring reports
 - Pre-Assessment form
- Dave Atkins – 406.329.3134
- Angela Farr – 406.542.4239
- Dean Graham – 406.370.8997

